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ABSTRACT

Language laboratory equipment and use in England are described, and guidelines are provided for the choice and purchase of equipment. An introduction explains laboratory function, advantages, and instructional techniques and describes a sample session. A section on preliminary planning explores staff requirements, types of courses, laboratory location, and other equipment. Some general remarks are made on criteria for laboratory equipment selection and laboratory design. Hints on staff and student preparation are also offered. Appendixes include a glossary, bibliography, and list of suppliers. (AF)

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AN INTRODUCTION TO THE LANGUAGE LABORATORY

by

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and

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Introduction to the Language Laboratory

FOREWORD

This manual has a very limited objective. It is not designed as a complete guide to the language laboratory and to its use, nor as a manual for the production of teaching materials. It is intended to be a practical introductory guide for Education Authorities, teachers and others involved in the introduction of language laboratories to schools, colleges and universities.

The remarks are based on personal experience of investigating, establishing and using language laboratories, on discussions with other laboratory users, and on practical discussions with manufacturers at the design stage of their equipment.

The authors are well aware that facilities required in language laboratories differ greatly, and that no laboratory can incorporate every facility without undue complication and cost. They hope that this pamphlet may be of some assistance in defining and assessing needs and determining the suitability of different makes of equipment.

It must be emphasised that although this introduction is almost entirely concerned with equipment, the language laboratory is useless without suitable teaching materials. It is most important that an adequate supply of such materials be made available to teachers, and that teachers should be given time and training to prepare their own materials, either complete courses, or additional drills, and other practice material.

It is also essential that adequate training facilities be set up to allow both trainee and serving teachers to become familiar with new techniques and equipment.

PART ONE

What is a language laboratory?

The language laboratory has been developed through recognition of the fact that a language is learnt by hearing and speaking it, and by repeating and recombining the patterns of the language as often as possible. The various combinations of apparatus aiding this process are listed below:-

(i) Tape recorder (or gramophone) with loudspeaker. This gives the opportunity of hearing a variety of native voices and of making choral repetition and responses.

(ii) Audio-passive language laboratory. Tape recorder with earphones for each student. This serves the same purpose as (i), but with the advantage that each student can hear the recording much more distinctly. The students may have individual booths to provide some degree of sound isolation and to give a sense of privacy.

(iii) Audio-active language laboratory. Tape recorder in teacher's control panel. Earphones, microphone and amplifier (sometimes all combined in one headset) for each student. With this arrangement the student's responses are audible in his headset, so that he can listen and compare objectively, and with suitable monitoring facilities the teacher can check individual progress, and possibly record students' voices. Booths may be provided.

The above arrangements necessitate choral work. All students are working on the same material at the same pace. (Although with several tape-recorders at the teacher's console, several programmes may be transmitted simultaneously to groups of varying ability.)

(iv) Teacher's console, each student having single-track tape recorder and headset. With this arrangement students' responses and the master voice are recorded so that they can be played back - but not re-recorded. Laboratories with student recording facilities normally incorporate booths.

(v) Full laboratory. Teacher's console and dual-channel tape recorder and headset for each student.

The teacher's voice and students' voices are recorded on different tracks so that the student can replay and re-record his own responses as often as necessary. This affords full opportunity for individual work.

(vi) Other types of laboratory may offer the facility of student recording without the need for individual recorders. They are probably not as flexible as the full dual-channel type, although they may be simpler in operation.

(vii) Developments, not at present available in this country, promise greater flexibility and future trends include the possibility of video-recording affording full opportunity for audio-visual work.

Of all the types of language laboratory available, the full dual-channel type offers the greatest flexibility and opportunity for individual work, and is the type most commonly installed.

The audio-active type, without individual student tape recorders, is useful for elementary work, particularly with younger children. Some authorities claim that the omission of recording facilities is of positive value, since it avoids the recording of incorrect language.

What does a language laboratory do?

It is generally agreed that a language laboratory is not a replacement for a teacher, but a very valuable aid in certain important aspects of language teaching:-

(a) improvement of pronunciation, intonation and fluency;

(b) comprehension of native speakers of the language;

(c) rapid response to foreign language stimulus;

(d) individual practice of particular difficulties;

(e) assessment and testing of achievement without interruption of work.

What advantages has the use of a language laboratory over other methods?

One of the chief advantages of the full language laboratory is that within limits each member of the class can work at his own pace, concentrating on his own particular problems, without holding up more capable students, or himself being held back by slower members of the class.

Another very important advantage is the vastly increased opportunities afforded for active use of the language by all students, as compared with the normal classroom situation.

As an example, in a school oral language period of forty minutes, each student in a class of thirty might have one minute of individual speaking (allowing only ten minutes for the teacher). For much of the remaining time he would be listening to the mistakes made by other children - or not listening at all.

In the laboratory this individual speaking time is multiplied by thirty. Thus when a new grammatical structure is taught there is up to thirty times as long for intensive individual practice of it.

The student gains in other important ways from the use of the laboratory. He is freed from the embarrassment of making mistakes in front of others - and thus gains confidence to try to the limits of his capacity.

He is able to call immediately for the help of the teacher without drawing the class's attention to himself and without feeling that he is interrupting other students.

The student can listen carefully to the voice of a native speaker, and repeat a phrase as often as is necessary for comprehension. He can record his own voice, hear it and compare with the model, then make an improved attempt, continually perfecting his work.

The teacher can when monitoring hear clearly what each student is doing, and can concentrate on weaker students. confident that others can work on. A carefully programmed language course will advance by small increments, thoroughly practised, so that the students can progress surely, without the danger of constantly making mistakes. Drills used in the laboratory are usually self-correcting so that a correct answer is immediately reinforced.

What sort of work is done in the laboratory?

This list is not exhaustive but indicates some methods of using the laboratory:

(a) Repetition of phrases for fluency, pronunciation and intonation.

e.g. Cue : Today is Saturday.
Response: Today is Saturday.
Cue : Today is Saturday.)reinforcement of correct
Response: Today is Saturday.) pattern.
Cue : Tomorrow is Sunday.
etc.

(b) Answer to question.

Cue : What day is it today? Saturday
Response: Today is Saturday.
Cue : Today is Saturday.)reinforcement of correct
Response: Today is Saturday.) pattern.
Cue : What day is it tomorrow?
etc.

(c) Drills on linguistic structures.

e.g. Cue : I like Saturday. He?
Response: He likes Saturday.
Cue : He likes Saturday.)reinforcement of correct
Response: He likes Saturday.) pattern.
Cue : You?

This type of drill, or adaptations thereof, can be used with all types of grammatical structure at all levels of difficulty, although it is not always possible, or desirable to enforce rigid correction.

(d) Comprehension of a connected passage, tested by questions in English or in the foreign language or by requiring a brief resume.

(e) Extempore translation from or into the foreign language.

(f) Commentary in the foreign language on a film-strip, ciné film or strip cartoon.

(g) Requiring student to take part in a prepared dialogue, only one side of which is recorded.

(h) Dictation.

(j) Reading practice.

(k) Ear-training, by listening to recorded conversations, etc.

In all of these activities the student is working by himself, the drills are wherever possible self-correcting, (i.e. answer supplied) and the teacher can at all times monitor and advise. He can even 'mark' the student tapes after the class.

With what type of students may language laboratories be used?

(a) Intensive courses, usually for adults, e.g. business men.
A common method of use of the following:

Period 1 Classroom: introduction of new material.
Period 2 Language Laboratory: practice.
Period 3 Classroom conversation and reading on new material, often with foreign assistant.

e.g. In schools this method may be used less intensively, for Sixth Formers starting a new language course.

(b) In Secondary school language courses. Here the same principles may apply, but the 3-hour session of the intensive course will be spaced over a week.

e.g.

Lesson 1 Classroom introduction
Lesson 2 Laboratory practice
Lesson 3) Classroom conversation, reading etc.
Lesson 4)
Lesson 5 Laboratory practice and testing
Lesson 6 Classroom work, composition, etc.

(c) Advanced work in Sixth Form or University for pronunciation and fluency practice, comprehension etc. Here the use of the language laboratory will often be on the 'library' system, in which students go into the laboratory on individual assignments, drawing the tape they require from the tape library, and practising individually.

(d) Remedial work, enabling late-comers, absentees or slow students to catch up on work they have missed or not mastered.

(e) Occasional use throughout the school language courses for comprehension, fluency, pronunciation, even when the main language course is based on conventional methods.

The length of a laboratory session will depend on the age and standard of the students. In general, schoolchildren will probably not use the laboratory for more than half an hour at a time. Older students, particularly in intensive courses, may have sessions of up to an hour.

The proportion of time devoted to laboratory work depends on the type of course and on the availability of the laboratory. Many teachers consider that roughly one third of language teaching time should be spent on laboratory work.

An Example of a Language Laboratory Session

1. The students enter their booths, switch on their machines, thread the tapes, put on their headsets and switch to the appropriate channel for receiving the lesson from the console.

2. The teacher ensures that all positions are working and correctly switched to the appropriate programme. He starts the student machines by remote control or gives the students the instruction to start their own machines, and plays the master recording on the console.

3. The students listen in to the programme, which is simultaneously being recorded on to their machines. They make their responses which are recorded on the student track. (On some equipment, the master recording must be recorded on student machines before the students' voices are recorded.)

4. At the end of the exercise the teacher stops the student machines (or gives instructions to do this), and instructs the students to rewind and playback. (This function may be controlled from the teacher's console.)

5. The students listen again to the master track and to their own responses. If necessary they repeat the section correctly, by rewinding to the beginning of the section, switching to 'record', which erases their previous attempts, but not the master track. They can thus record a new attempt, switch to playback, rewind and listen again. This process can be repeated as often as necessary.

6. The teacher monitors this individual work by switching to each student in turn, without the student's knowledge. If necessary he stops a student's machine, or tells the student to do so, and discusses the problem.

7. If a student requires aid he calls the teacher by means of a call button or by raising his hand, and two-way conversation is possible without disturbing other students.

8. At the end of the exercise or the lesson the students rewind their tapes and erase them on a bulk eraser. If a master erase is incorporated in the laboratory this need not be done since the new master recording will erase the old one.

N.B. If the next class is to use the same material the student tapes are not erased, but are left ready in position.

In library use, students enter individually and draw tapes from the library. There is then no duplication of a programme from the console, and the teacher's only function is monitoring and advice.

In some circumstances it may be preferable for the programme to be duplicated prior to the entry of the class, so that they start individual work immediately.

With a class of mixed ability or when several small groups use the laboratory simultaneously, it is possible, with some makes of equipment, to broadcast a number of programmes from the console at the same time.

If a film-strip or slide magazine series is used it will be shown at the same time as the mass-duplication, either manually, by remote control, or automatically, governed by impulses from the master recording.

P A R T T W O

PLANNING FOR A LABORATORY

Preliminary Planning

(i) Staff requirements
(ii) Type of courses
(iii) Siting
(iv) Ancillary equipment

(i) Staff requirements

(a) Laboratory Director.

One member of the staff, not necessarily the head of department, should be in charge of the laboratory and responsible for its administration. It is essential that he be allowed time for his duties.

Duties of Laboratory Director:

Ensuring the availability of teaching materials;
Indexing and storage of teaching materials;
Administration of rota for the use of laboratory time, including private study periods;
Correlation of complaints and suggestions;
Dealing with visitors;
Training new members of staff;
Advice to bewildered teachers;
Keeping Fault Book on console to be signed after use, with notes;
Inspection of laboratory after use, etc.
Supervision of Steward;
Checking service and maintenance;
Liaison with manufacturer;
Ordering tapes and other materials.

(b) Laboratory Steward.

A steward should be considered essential, not so much for major repairs as for routine servicing and checking. If a teacher has to devote time to these matters before a class can start work, the efficiency of laboratory use is impaired.

The console and student positions require regular servicing by way of:

cleaning and demagnetising of recording and erase heads;
cleaning of tape decks;
checking adjustment of all parts, pressure pads, brake tension, etc.;
disinfecting of headsets and microphones;
maintenance and storage of tapes.

These duties might be fulfilled by a senior student devoting an hour a day to them. Other duties which demand more time and/or technical knowledge are:

operating master recorder for the production of original programmes;
mass-duplication of tapes;
major overhaul, servicing and repair (the companies supplying laboratories often do this on a service contract basis);
presence during laboratory sessions to assist teachers and students with their technical difficulties.

If the steward is expected to carry out all major servicing, and maintenance he should be a qualified electronic engineer, and should preferably undergo a course of training with the manufacturer of the laboratory.

For routine checking, cleaning and servicing, qualifications are not needed, and a technically minded student might be suitable. It is possible that a Physics laboratory steward might devote some of his time to the language laboratory.

(c) Allowance of time for preparation of materials:

It is very unlikely that all the material needed for use in the laboratory will be available commercially, and the majority of teachers will need to prepare their own material. This is a very time-consuming process and adequate allowance must be made for it on the timetable.

(ii) Type of courses

Before deciding the number of booths, and console facilities required, the following questions must be answered:

With what courses will the laboratory be used?
Intensive/Advanced/Elementary/General School.

Will the laboratory be used for classes or only for private study, or both?

Will several programmes be transmitted simultaneously?

What size of classes will be using the laboratory?

Will two teachers need to use the console at the same time?

Will the laboratory be required for use as an ordinary classroom? (This should be avoided if possible, since expensive laboratory equipment should be available for use the whole time).

Will visual aids be used? If so, which of the following:

- film-strips
- 35 mm. slides (full or half-frame)
- cine films
- wall charts
- flash cards
- overhead projection
- closed circuit television.

(iii) Siting

Is a room to be built specially, or will an existing one be adapted? The suitability of a room must be assessed on the following factors:

External quietness - There should be as little disturbance as possible from passing traffic, vehicular or human.

It is desirable that other language teaching rooms be nearby so that classes can transfer from laboratory to classroom or vice versa with minimum disturbance or loss of time.

Size - The room must accommodate the requisite number of positions and the console without cramping, with adequate gangways and with room for future expansion if envisaged. If visual aids are to be used, there must be space for the projector and the screen to be placed within the field of view of all students.

There should be space for a separate recording studio, preferably with one entrance into the laboratory and another one external. Ideally the studio should consist of two rooms separated by a double glass window to isolate the microphone from mechanical noise produced by the recorder.

There should be a maintenance room; if necessary this could be combined with the studio.

There should be storage facilities for tapes, discs and visual materials. If library use is intended, there should be an issuing counter convenient to the entrance.

It is desirable to have provision for hanging coats, bags, books, etc. which should not be taken into the booths.

There must be adequate ventilation and lighting. Booths tend to cut off light, so extra provision may be needed. If fluorescent lights are to be used, they should be noiseless. Electronic equipment may generate heat, so (soundless) ventilation is needed.

There must be adequate power supply for console, student positions, projector, master recorder and bulk eraser, and electric outlets convenient for these pieces of equipment and preferably a master switch and warning light. It may be necessary to make these provisions well in advance of the installation of the laboratory.

The room may need to have additional acoustic damping, in the shape of acoustic tiles on walls and ceiling, and cork tiles on the floor. Venetian blinds reduce the sound reflected from windows, as well as providing the dimness required for visual aids. If they are fitted a rubber strip in the frame will prevent rattling.

It may be desired to fit an extra lock on the door to discourage intruders.

(iv) Ancillary Equipment

Some of this is essential to all users, other items may be omitted:

Essential

(a) Bulk Eraser: Even if master erase is fitted in the laboratory the tapes must be bulk erased at intervals to remove background noise.

(b) Head demagnetiser and tool kit: All machines must be regularly serviced if good performance is to be maintained.

(c) Tape splicer and accessories: including splicing tape, different coloured leader tape, tape storage including index cards and adhesive strips.

Desirable

(a) Master Recorder: With some laboratories it is possible to make original master recordings on the console or on student machines but this is obviously impossible if the laboratory is heavily used. It is in any case desirable to have the master recorder in a separate studio.

There is an inevitable drop in quality when tape recordings are copied. Since there must be copying from console to student positions it is necessary that the original quality should be the best obtainable. There should be facilities for monitoring recording by meter or magic eye and through earphones.

There must be gaps for student repetition in language laboratory programmes, but it is undesirable to have these gaps in the original reading since intonation would become artificial. If recordings are made from the radio, the passage will be continuous. Therefore it is necessary to have some means of 'exploding' a text, i.e. inserting the gaps for repetition. This can be done most conveniently by having the master recorder constructed with two decks. The original recording is played on one deck, the tape being stopped as required. The tape on the other deck, on which the material is being dubbed, is allowed to run without interruption so that gaps are left on it. This process can be carried out, less conveniently by using two separate recorders - but both should be of the highest quality.

(b) Spare student machine and headset: Most makes of laboratory have student machines that are quickly replaceable. In the event of breakdown it is obviously desirable to have a machine and headset at hand for immediate replacement while the faulty one is serviced.

(c) Filmstrip or Slide Projector: Hitherto visual aids have usually been in the form of filmstrips, but it is now widely agreed that the 35 mm. automatic slide projector is more convenient, for loading and unloading and for automatic remote control.

(d) Synchroniser: This operates the slide or film strip projector automatically by an impulse on the tape so that the teacher is free from the necessity of changing slides.

(e) Overhead projector: This type of equipment throws a large image on to a screen in daylight. It is convenient as a replacement for the blackboard, having the advantage that notes may be kept, and it may be used in the laboratory, since it presents a large clear picture, or a series of pictures on a transparent roll, or a picture built up by multiple layers of transparent material.

(f) Screen: It is very undesirable to have the laboratory blacked out and a better solution is to have a screen which is itself shielded from light or to use a rear-projection screen which gives a bright image in daylight.

It must be borne in mind when positioning the screen that all students must have an unobstructed view of it, and that the image should be adequately large and bright. When considering the use of visual aids it should be remembered that the use of a projected film-strip or slide series presupposes that the class is working together. Individual work at one's own pace is impossible. It may therefore be considered that the visual aids used in the laboratory should be individual ones, e.g. a sheet of cartoon drawings, and that the film-strips or slides should be used in classroom sessions.

THE CHOICE OF A LABORATORY

It must be borne in mind that none of the equipment available incorporates every facility, and no manufacturer can provide everything at a reasonable price. It is impossible to give an 'ideal' specification since individual needs will differ so widely. When choosing the equipment have clearly before you the functions you will require and choose a make that suits you. Do not ask for expensive extras you will never use, and that add to the cost and complication of your installation. The more complications there are, the more there is to go wrong or to confuse staff and students.

Technical specifications are useful, and should be taken into account - have an expert, a physics or engineering teacher examine them and comment if you are not yourself competent to do so, but it is the equipment itself and its convenience, comfort, performance under normal conditions, its simplicity and reliability that really count.

Research has indicated that the frequency response needed for fully satisfactory reproduction of European language speech is at least 100-7300 cycles per second, level to within $\pm$ 3 decibels at 1000 cycles. The whole system should meet this specification. Headsets are usually the weakest link.

Remember that an electronic expert or engineer is not interested in the same things as a language teacher. He may recommend the most sophisticated equipment, regardless of whether it is simple to use and likely to be long-lasting and trouble free, even when used by many different, unskilled people.

When you have studied manufacturers' literature and decided which are the most suitable makes, it is advisable to ask for a thorough demonstration, and if possible to prevail upon the representative to leave his sample equipment for a few days so that you can become thoroughly familiar with it, and get an expert colleague to examine its construction, mechanical and electronic.

Another valuable exercise is the visiting of established laboratories using the equipment on your short list to find out what actual users of the equipment think of it. They will have discovered strong and weak points. If a visit is impossible a letter or questionnaire requesting information on specific points can be most helpful.

When examining equipment put yourself in the position of student and teacher under working conditions. Carry out all the functions of mass duplication, monitoring and intercom from the console, and in the student position listen to the master, make responses, overcoming your natural self-consciousness, re-record, call the teacher, etc. Determine whether your slowest student would find using this equipment straight-forward and comfortable. Listen to the quality of reproduction, test for clear distinction between s and f; v, b and m; sh and j, and other similar sounds. Remember that you may be able to understand the foreign sounds by guessing, because of prior knowledge and familiarity, whereas a student hearing words for the first time has to rely entirely on the clarity of reproduction. It may be helpful to do an exercise in a language unfamiliar to you, and have it checked, to test whether you really can trust the quality. Likewise, recording the above-mentioned pairs of sounds and asking a colleague to repeat them will be illuminating.

If a salesman makes claims for his equipment, test the claims ruthlessly. If a brochure states that a particular facility is incorporated, find out whether it is convenient and efficient to use and whether it is a useful feature.

The following list of factors to consider can be used as a check list. The remarks are personal opinions of the authors which may, of course, be disputed by other laboratory users.

STUDENT DECK

The student deck will have the following basic controls:

- on/off switch
- volume control (ideally one for each track)
- tape transport control, with positions for stop, rewind, play, record, fast forward. This control may be in the form of a single switch or a series of buttons or keys.
- electronic function control, with positions for student record, replay and duplication from console.

On some equipment some controls will be combined or omitted.

Reliability

Robust construction:

In a laboratory the rewind-replay switches receive far more use than on a normal tape-recorder. Decks for laboratory use fall into three classes:-

(a) specially designed;

(b) adapted professional or semi-professional decks;

(c) adapted domestic entertainment decks. Consider equipment in the light of probable intensity of use.

Simplicity:

Minimum controls - All essential ones must be available.
Clearly labelled controls - Words are better than symbols to indicate functions.
Positively acting switches - 'woolly' switches may cause apparent non-functioning.
Fast Forward Control - Ensure that this is adequately fast, to avoid delays.

Automatic recap. - i.e. automatic resumption of playback or record after rewind or fast forward.
Convenient operation of switches for rewind-replay-record is essential since this is the most frequently performed operation, and it is greatly facilitated by the provision of automatic recap.

Positive braking - It is essential for the tape motion to stop quickly when the 'stop' switch is used, to ensure exact location of a word or phrase, and to stop tape flying off the spool.

Aural read-back - i.e. ability to listen to 'twittering' or 'monkey chatter' during rewind or fast forward to locate start of drill.

Tape threading - There should be no complicated path through which the tape must be threaded. If a cassette is used discover whether it uses standard spools, what the longest tape length is, whether you can load and unload the cassette, check price and guaranteed availability. Some laboratories incorporate automatic take-up of the tape. Others stop the tape automatically on rewind, thus avoiding tape spillage.

Single speed - 3 3/4 i.p.s. is adequate for recording speech.

Pause Button - This is unnecessary on equipment with convenient stop-control.

Counter - This is helpful in assisting rewinding to the start of a drill, provided that the counter is accurate. During re-recording of individual phrases it is unnecessary.

Comfort

Work top at right height and angle - think of the size of your students.

Adequate space for writing and for books.

Controls within easy reach.

Controls well spaced.

Controls operable by left-handed students - with some makes the deck is in a trough and can be moved. With others the controls are comfortable for left-handed and right-handed people.

Controls comfortable and suitable size and easy to move - remember a child or a woman may have small weak fingers. Some switches are so stiff and badly designed that it is impossible to move them without the use of great force.

No sharp edges or rough finish.

No protrusion to catch knees.

Headset
- light yet robust.
- adjustable
- padded or covering ear completely
- hygienic: earpads removable for disinfecting, or easily sponged
- noise muffling
- not too strongly sprung.

The headset may need to be worn for as long as an hour. A stiff, heavy, tight one may cause so much discomfort as to destroy concentration.

Boom microphone - this is preferable, since whatever position is adopted it remains at the right distance from the mouth. It should be adjustable. A desk mounted microphone may require one position to be held for good reproduction. This position may be hunched and uncomfortable.

Performance

Clear reproduction.

Volume control - this is necessary to compensate for different sensitivity of hearing. It is advisable to have a minimum level pre-set, so that the student cannot tune out the programme.

Tone control - this is probably unnecessary for speech.

Master and student track recorded equally clearly and at equal volume.

Direct microphone reproduction should be good.

Class intercom and individual intercom - good quality.

Audio-active headset - i.e. the student hears his own voice in the headset as he speaks. This is most necessary, since it provides a feeling of objectivity. The teacher's headset should also be audio-active.

Master track and student track muted when teacher uses intercom.

Efficient erasure of student track (and master if fitted) - check that previous recordings are completely erased.

Unidirectional noise-cancelling microphone. This is desirable to obviate recording of background noise.

No hiss or hum.

Noiseless switches.

No electrical interference from other positions or from console, lights, or other electrical equipment.

Distinction possible between voiced and unvoiced consonants - z and s, b and p, sh and j, etc.

Intonation pattern easily distinguished.

Other features

Monitoring point for teacher visiting student position.

Call button - it may be questioned whether this is necessary if the teacher can see a raised hand, which is not liable to failure or frivolous use. On the other hand students may be shy of calling the attention of others by raising the hand.

Acknowledgement of call.

Tamper-proof - no loose screws or controls visible which should not be used by student. Laboratory will receive constant use from careless, clumsy and sometimes deliberately destructive students.

Plugs for headset, power and connection to console inaccessible - a favourite trick is to reverse the plugs for earphones and microphone.

Tape treated carefully by the machine - smooth, efficient braking, auto-stop of tape either by foil, photo electric eye, or microswitch.

C O N S O L E

The Console will have facilities for relaying one or more programmes to students, for monitoring students and for two-way conversation between the teacher and the student, and for the teacher to address the class. There may also be provision for making master tapes and for recording and relaying the voices of students at work.

Remote control of student decks may also be possible.

Comfort and simplicity

All controls easily reached.
Deck at correct height and angle.
Controls clearly labelled.
Controls self-cancelling. Forgetting to cancel switches often leads to apparent mal-functioning.
Switching reduced to a minimum.
Desk with storage space included.
Room for texts and for writing.
Boom microphone - the teacher may wish to stand up or go to the blackboard, etc. A reasonably long lead to his headset will allow this.

Mass Duplication

Programme sources - how many are included in the price?

(a) Tape decks (possibly more than one)
Standard tape use - i.e. tapes recorded here can be used in other machines and vice versa.

Speeds 1 7/8, 3 3/4, 7 1/2 i.p.s. to accommodate all tapes from all sources. Master tapes should normally be recorded at 7 1/2 i.p.s.

Can console tape deck be used for making master recordings?

Cue Control - this allows manual tape transport to determine exact position of start of drill.

Pause Control - this allows for 'exploding' drills during transmission.

(b) Gramophone - 3 or 4 speed to accommodate all types of record.

(c) Radio tuner - this should include F.M. (V.H.F.) and A.M. (short, medium and long waves).

(d) Direct broadcast - i.e. teacher reads drills through microphone for duplication.

(e) Sockets for extra sources - normally a tape recorder, gramophone, radio, or sound film projector can be plugged in as programme sources.

How many programme sources are usable at one time?
Can the teacher transfer one or more programmes to:

'i) the whole class?
'ii) selected groups?

Do these groups consist of rows or is random choice possible?
How many groups can be dealt with at once?

'iii) selected individuals?

Student selection of programme - In very advanced laboratories students can dial the programme they require.

Master erase - i.e. the teacher can erase the previous master track on the student machines, when duplicating a new master recording. Is this done:

'i) From the console?
'ii) By a key used by the teacher on each student machine?
'iii) By a switch on each student machine?

'i) is most convenient. 'iii) opens the possibility of accidental or deliberate erasure of master track by a student.

Is mass duplication an easy operation?

'i) for the teacher?
'ii) for the student?

Has the teacher control of student machines during duplication?

'see later - Remote Control)

Can teacher check on correct switching and operation of student machines from the console before starting duplication?

Can teacher monitor each programme during duplication:

'i) by listening?
'ii) by meter?

Can teacher adjust volume 'and tone) of each programme separately?
Can teacher monitor students during transfer?
Is there a pause button or convenient stop control?
Can students record responses during duplication? This is most valuable. If it is not available the versatility of the laboratory is greatly restricted.

Remote Control

Relays or transistor circuits for remote control of student decks add to the cost and complication of equipment and some manufacturers prefer not to fit this facility, stating that it is better for the teacher to give instructions to the class to perform the desired switching individually. It is certainly possible to do this quite efficiently under most conditions, although it may cause delays and complications with slow students. However, the proposed use of a laboratory should be carefully considered before deciding to do without this facility. If it is intended to carry out mass duplication before the entry of a class, remote stop and start control is essential, since all student decks must start roughly at the same time.

Complete remote control of all functions of student machines is possible and may be convenient, for example during monitoring, if the teacher wishes to refer to a specific portion of a student's tape and to record his own comment on the student track. Likewise a teacher may wish to play and mark tapes after a class. With full remote control he can do this from the console, and erase the student track of every machine 'and the master track if master erase is fitted).

Each prospective laboratory user must decide whether the use he will make of full remote control justifies the cost and complication and extra likelihood of breakdown involved.

Types of Remote Control:

1. Complete control of all functions of student machines.
2. Control of stopping and starting of tape.

It may be necessary for the student or laboratory steward first to have switched the machine to certain positions (e.g. tape transport to forward, and electronic function control to duplicate) before remote control operates.

Remote control may be effected

(a) over all machines
(b) over selected groups
(c) over individual machines

Discover just what degree of remote control is available on each make, and whether it suits your purpose.

Monitoring

Possible during all operations?
Without student's awareness?
Simple operation?
Type of switch - some makes use one switch per position, others a combination of two rotary switches, one for row and one for number of booth.
Possibility of monitoring more than one student at a time. This facility is useful if two teachers wish to use the laboratory at the same time. Consoles often include a guest outlet so that two teachers can listen, but the provision of full monitoring and intercom facilities is normally made only to special order. If this use is to be infrequent it may be better to rely on the provision often made for a teacher to plug into the student deck. Thus one teacher uses the console while the other moves from booth to booth.
Possibility of recording students' voices on master console for future marking. This facility may be built in or it may be necessary to use a separate recorder. It is desirable to have it incorporated in the console.

Intercom

Class all-call by one switch (self-cancelling). If there is no all-call switch it may be necessary to operate a number of switches simultaneously in order to speak to the whole class or group.
All-call possible during all operations. It is not normally necessary during duplication, but class should hear teacher whatever operation they are performing.
Call selected group

(a) random group
(b) row

Intercom possible without stopping student deck if desired.
Student's voice audible to the teacher under all conditions.
Teacher's comments recorded on student track only.
Possible to relay one student's voice, live or recorded, to

(a) whole class
(b) group
(c) individual

Conversations between two or more students possible. If this is possible it should only be through console, to avoid unauthorised conversations. It may be considered that the laboratory is not a suitable place for conversation practice, which may be carried on more naturally in a classroom without the use of elaborate equipment.

Call system

(a) light
(b) buzzer

Does light remain on until answered?
Can teacher acknowledge call?

G E N E R A L

Siting of console.

The console is usually placed at the front of the laboratory but it should be considered whether it would not be preferable to place it at the back. Here the teacher still has control, and is close to the projector, while the students' sense of privacy may be increased if he cannot see the teacher.

The console may be placed on a rostrum to give the teacher a better view of the class. It may be glassed in to protect the teacher from noise and to give the students greater apparent isolation.

A high telephone operator's type chair is perhaps the most convenient for the teacher.

Built in amplifier and loudspeaker for class use.

It may be desired to play material, songs, etc. through loudspeaker, to rest ears from headset. Some teachers play the first reading of the master recording on loudspeaker. This is important if there are not enough booths for all students in a class.

Synchronisation for remotely controlled film strip or magazine slide projector.

(a) built in to the console.
(b) extra item.

Simultaneous translation facility.

This requires the ability to play the programme and for students to record the translation and to replay the latter without the master track. There are three systems:

(a) Direct transmission of programme via loudspeaker or inter-com, without recording on the master track. This demands that all students work at the same pace on the same material.

(b) Duplication of 'exploded' material, with gaps for students to record translation.

(c) Track isolation. The programme is broadcast and duplicated continuously on to the master track, while the students record their translations on the student track. When playing back the master track is tuned out, so that the translation alone is heard. It is necessary to have separate volume controls for each track.

Possibility of future expansion of laboratory.

Will this be easy?

Servicing of equipment

Period and scope of guarantee:

(a) materials
(b) labour
(c) transport costs

Maintenance contract:

(a) regular visits
(b) emergency visits.

Nearest service station.
Speed of service.
Servicing carried out by manufacturers or main agents or by local firm.
Spare parts available in Great Britain.
Precise terms and costs of service should be offered in writing.
Training of laboratory steward by manufacturers.
Service Manual and complete wiring diagram provided.
Unit construction for easy replacement.
Plug-in-units for easy replacement.
Equipment brought up to date as improvements are made.
Ease of dismantling and erecting elsewhere.
Possibility of using recorders (student or master) outside the laboratory e.g. for individual practice at home or for classroom use.

Miscellaneous facilities offered by manufacturers

Staff training
Operation manual
Advice bureau
Help with preparation of material (the exact scope of this help should be ascertained.)
Courses available
Tape available (should be good quality and boxed).
Co-operation in arranging visits to established laboratories.

Obtaining estimates

Obtain exact and detailed quotations from several firms, covering all the equipment you need. A good firm will make a very thorough survey and make detailed suggestions.

Console

Programme sources included
Remote control
Master erase
Call system
Desk unit
Rostrum
Simultaneous translation facility
Projector synchroniser.

Student position

headset and microphone
tape supplied (what size of spool?)
take-up spool

Booths

Dimensions
Materials
Erection.

Installation

From mains to console?
Including materials?
Including mainswitch, warning light and necessary outlet?

Acoustic treatment for room

Extra equipment

bulk eraser
spare machine and headset
toolkit (what does it contain?)
sundry spares
head demagnetiser
splicer
projector synchroniser
projector (exact specification)
magazines.

Delivery date

Installation time

Assistance required

Insurance

Operational manual

Service manual and wiring diagram

B O O T H S

The purpose of booths

Cutting down sound transmission between student positions.
Lowering of general sound level by absorption of sound and damping of echoes.
Physical isolation of students, giving the sense of being in a private study and thus removing a cause of shyness and reluctance to attempt speech in a foreign language.
Aid to concentration.

Factors to consider in choosing booths

Layout of room.
Layout of booths - normally determined by the size of the room.
The usual layout is in rows. The number of rows and the booths in each row may be affected by the number of programmes to be transmitted at once, since some laboratories have each row connected separately.
Visual aids to be used - need clear line of sight from each position to screen. This will affect the height of front and side panels.
Teacher to be visible (?) and to have students in view.
Room to be used as normal classroom if this is unavoidable:- collapsible booths would be desirable.
Writing to be done or texts used during laboratory use. This indicates need for clear surface usable while machines are running.

Materials

Side panels should be faced with sound damping and absorbing material, e.g.
acoustic tile
perforated hardboard
metal mesh, etc.

The cavity behind the panel should be filled with glass fibre, expanded polystyrene or similar materials.

Plain side panels in wood or other smooth surfaced material reflect sound and are generally considered unsuitable, although acoustic panels in wood may be excellent.

Front panel. This may be rigid or in the form of a hinged lid that covers the recorder when not in use. Fixed panels may have a glass insert to afford visibility of screen and teacher. If this is the case the glass should be fitted so as to be free of rattles, and the possibility of reflections should be taken into account.

Plastics may be used for the front transparent panel. This may become discoloured or scratched in time.

In some laboratories there is no glass panel, the opaque portion being low enough to be looked over.

It is advisable to have the front panel faced with acoustic material.

If the front panel is in the form of a lifting lid the action should be light and positive, with no chance of accidental lowering. The underside should be sound absorbent.

In some installations the side and front panels are both collapsible, affording a completely flat surface when lowered. It is doubly important in this case that the mechanism should be light, positive and durable. The acoustic properties should be good.

Some types have no front panel but merely a side hinged desk top. It is questionable whether this is efficient.

If it is at all possible it is desirable to have the room reserved entirely for laboratory use since any dual purpose use will require compromise and loss of efficiency of the booths for their purpose.

One type of collapsible booth has the side and front panels in one piece, hinged along the front edge of the desk.

In a room containing a relatively small number of student positions it may be possible to place the booths around three sides of the room. In this case the booths may be of the type used in record shops or for telephones.

Check List

Size.
Visibility (for all students, even the smallest).
Writing space - remember left-handers.
Rigid construction - no rattle or sway.
Good finish - no protruding screws, bolts, etc.
Light finish.
Durable materials - not susceptible to marking.
Acoustic qualities.

PART THREE

THE USE OF THE LABORATORY

Staff Preparations

The most elaborate equipment is useless without skilled operation. The language laboratory is a teaching aid and the teachers who use it must be aware of its purpose and its potentialities, and trained in the techniques necessary for its exploitation.

In this country there are still too few opportunities for teachers in training to learn language laboratory use, and experienced teachers must largely rely on reading, discussion and conferences to become aware of these new approaches, although courses are held, usually over subscribed. It is to be hoped that Education Authorities, Training Colleges and Departments of Education will feel able to assist teachers to familiarise themselves with this most important tool, which can be so easily misused and wasted if not skilfully operated.

It is inevitable that in Languages Departments containing a number of teachers of differing ages and outlooks there should be differing attitudes to the introduction of a Language Laboratory. It is therefore of the highest importance that all members of the department should be as fully as possible familiar with the principles of laboratory work before they are required to undertake it, so that they approach the new method with confidence and open minds.

Everyone should have been given the chance of having equipment demonstrated, of visiting existing laboratories and discussing methods of use with teachers already using them, of attending courses and conferences. It is advantageous to buy one or more copies of a book such as 'The Language Laboratory and Modern Language Teaching' by E. M. Stack, (O.U.P.), and pass it round the department, and to discuss the type of equipment and the courses to be used with all those who will be involved. It is particularly important that those who fear the mechanical complexity of equipment should be reassured.

The staff should be given the opportunity of questioning firms' representatives at length, and if possible sufficient copies of the instruction manual should be obtained and passed round well before the actual installation.

When the laboratory is installed there should be opportunities for staff to practise using it intensively before any teaching is attempted. This will help to prevent panic and consequent frustration and antipathy to using the laboratory on the part of staff and students.

It is advisable for senior members of staff to learn the use of the laboratory before the rest of the department, and perhaps to practise with one pilot class so as to discover any unforeseen snags, and warn other staff of them. A check list of operations to be done should be duplicated and a copy given to each member of staff and one fixed permanently on to the console. It should include a list of likely snags and their causes. This is most important since during the first weeks of laboratory use staff and students will repeatedly become convinced that something is out of order, while the real cause of mal-functioning is a failure in operation on the part of staff or student.

Failures may consist of such things as:
Forgetting to switch on power, or individual machines.
Student has switched to record instead of replay.
Tape incorrectly threaded, non-coated side facing heads.
This is perhaps the most common single cause of apparent failure.

The possibility of these and other mistakes occurring will vary according to the make of equipment chosen, so that it is impossible to give a list. However, every user will learn by experience what may happen, and it is best for the laboratory director to have experimented and discovered likely snags for himself so that class work shall not suffer.

Student preparation

If a training tape is supplied with the laboratory equipment, make sure that the instructions are clear. It may be advisable to make one's own training tape.

On or before the first entry into the laboratory a clear simple explanation of the purpose and working of the laboratory should be given, including some simple electronic explanation which may help students to remember they must rewind before replaying and that the coated side of the tape should face the recording heads. A reference to the well-known phenomenon of iron filings being moved by a magnet is helpful.

The use of one class for "guinea pigs" as suggested in the section on staff preparation may be helpful in highlighting the difficulties likely to be encountered by students.

The first session in the laboratory may include a period when students are allowed to experiment on recording and playback and use of intercom. Then a simple drill in English should be duplicated and the students should practise using it.

The first foreign language work done in the laboratory should be extremely simple, preferably revision or reading practice, so that the students can concentrate on operating the laboratory. Very soon the operation will become automatic and then they can concentrate on the language.

The use of the laboratory should be disciplined and orderly. The proper sequence of operations must be rigidly followed.

A check list of operations should be fixed at each student position, so that students do not have to ask for the repetition of routine instructions.

Efficiency in the use of the laboratory depends on this orderly sequence of operations, and on the avoidance of time wasting. If everyone knows exactly what to do, lessons progress smoothly, but if there is disorder, valuable time will be wasted. Like industrial equipment the laboratory must be used efficiently if it is to justify its cost, and if students are to gain maximum benefit from their individual practice time.

Any failure in correct use, or activities such as twisting tapes and leads, switching plugs, deliberately choosing the wrong switch position, altering tape speed must be discouraged. A plan of the laboratory with the names of each student using each booth should be kept to assist in tracing malefactors.

Tape Requirements

Tape of the highest quality should be used. The most suitable is standard polyester tape, which has the strongest backing. Acetate becomes brittle . Tape should be supplied in boxes with index space, and should be stored away from heat and electrical currents. It may be stored on open shelves, in cupboards, or in filing cabinets. The tape should be protected from dust.

The five inch (600 feet) size of spool is suitable for general use, both in the student positions and on the console. For ease of filing and of finding the desired drill one track only should be used and only material for one lesson should be recorded on each tape.

Tapes should be identified on the box, by an identification strip and by a recorded number or title at the beginning and end of the tape. The identification strip may be written with a ball-point pen on white leader tape. Master tapes may be visually divided into drills by the use of leader tape on the back at the beginning of each drill.

If student tapes have long leaders, the tape is less likely to come off the spool when rewinding.

Student tapes should be reversed regularly, since the beginning tends to get the most wear. It is not desirable to use spliced tape on a student machine because of the constant rewinding and replaying.

Student tapes should be withdrawn when they begin to become transparent. One of the steward's duties should be to check tape condition.

To avoid accidental erasure, the master tape should not be used in the laboratory. A copy master should be made for console use. This may be used for library purposes after the lesson has been dealt with in class, or it may be desired to make one or more library copies. It is prohibitively expensive to provide one master per booth as is sometimes advocated.

Example: For each year of each language course:-

No. of lesson units per year e.g. 20
No. of booths e.g. 20

Thus requirements of student tape per language per year: 20 x 20 = 400. At 13s. 6d. the cost of tape would be £270 per language per year.

In addition the cost of master tapes and spares must be taken into account.

Requirements of master tape

Number of lessons x number of years x number of language courses x number of copies desired for console and library use. e.g. Russian course; two years; twenty lessons per year. One original master, one console master, four library copies: 2 x 20 x 6 = 240.

The same requirements for French, German, Italian, Spanish. Total master tape requirement for normal courses = 1200.

In addition there may be additional material, tests, songs, recordings of broadcasts, etc.

The purchase of tape can, of course, be spread over a period of months or years. However it should be possible to obtain a discount if tapes are bought in bulk.

Student tapes - the minimum requirement is one for each position. In addition allowance should be made for spares, to avoid the need for bulk erasing at the end of each lesson, and to allow for breakage and wearing out. It is advisable to allow three tapes per booth. Thus in a laboratory of 20 booths the initial allowance should be sixty tapes. One tape per booth may have been supplied with the laboratory. It should be remembered that tape wears out, and provision should be made for this in budgeting.

Sundries to be budgeted for

- Splicing and leader tape.
- Lead for demagnetiser.
- Cleaning fluid.
- Fuses.
- Projector lamps.
- Slide mounts and magazines.
- Storage.
- Index tabs and cards.

Appendix 1

Appendix 2

Appendix 3

APPENDIX 1.

GLOSSARY

Audio-active

The student hears his own response amplified through his headset as he speaks.

Automatic recap

Facility for automatic resumption of forward tape transport after rewinding.

Boom microphone

Microphone attached to headset, leaving the hands free, and aiding optimum placing of microphone.

Bulk eraser

Apparatus which quickly erases all recordings from a magnetic tape.

Cassette

Plastic container holding the feed and take-up spools and the tape.

Console

Teacher's desk and control panel, containing one or more programme sources, monitoring and intercom facilities, and possible remote control of student machines.

Cue switch

Switch enabling the tape to be moved by hand, while listening to the recording, so that the exact start of a passage may be located.

Direct broadcast

The teacher reads a text or drill into the microphone, and his voice is recorded directly on to the students' tapes.

Dual channel tape recorder

The type of recorder used in the students' positions has two recording tracks or channels, one for the master programme, the other for the student's response.

Duplication

Also known as 'transfer' or 'dubbing'. The operation of transferring the recording from the console to the students' tapes.

Erase

The deletion of a recording from the tape.

Exploded drill, text, etc.

A text with pauses for student repetition or response. The recording may be made with pauses, or pauses may be inserted later, on re-recording.

Function switch

The switch (or row of switches) on the student machine selecting the mode of operation, e.g. duplication, recording, replay.

Head demagnetiser

Apparatus for demagnetising the recording and erase head of a tape recorder, to prevent the build-up of background noise on the tape.

Intercom

The facility for teacher and student to talk to each other via headsets and microphones. There may be a light or buzzer for the student to attract the teacher's attention.

Magazine

See cassette.

Master track

The track on the student's tape on which is recorded the programme from the console.

Master erase

The facility of erasing the master track prior to recording a new lesson.

Monitoring

The operation of listening to each student's work during a laboratory session.

Pause button

Switch to stop the tape transport momentarily, without cancelling the selected mode of operation.

Programme

A recorded lesson or series of drills played on the master console for relay to the student positions.

Programme source

Tape recorder, gramophone, radio tuner, sound ciné projector or microphone operated from the teacher's console.

Projector synchroniser

Apparatus to operate a slide or film-strip projector by remote control, in synchronisation with the recorded programme, by means of a sub-sonic signal, metallic foil etc.

Student track

The track on the student's tape on which his responses are recorded. The recording on this track is erased each time the student wishes to repeat the drill.

Track isolation

The facility of tuning out the master or student track by means of a volume control, so that the recording on the other track can be heard without interference.

Uni-directional microphone

A microphone sensitive only to sound immediately in front of it, so that it does not pick up extraneous noises.

Vu-meter

The meter indicating the strength of the signal, to assist setting the correct recording level, either on the master recorder, or during duplication.

APPENDIX 2.

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J. B. Hilton. Methuen

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ed. E. M. Stack. Electronic Teaching Laboratories.

Audio-Visual Language Journal
Organ of the Audio-Visual Language Association (AVLA)
ed. 121 Gordon Road, South Woodford, LONDON, E. 18.

Programmed Learning
Journal of the Association for Programmed Learning.
pub. Sweet & Maxwell Ltd.

New Education
Bracken House, Cannon Street, LONDON, E.C.4.

APPENDIX 3.

Suppliers of Language Laboratories

Cédamel	R.C.A. (Great Britain) Limited, Lincoln Way, Windmill Road, Sunbury on Thames, Middlesex.	Sunbury on Thames 5511
Cybervox	Cybernetic Developments Limited, Snow House, 103/109 Southwark Street, London, S.E.1.	Waterloo 5436
E.F.V.A.	Educational Foundation for Visual Aids, 33 Queen Anne Street, London, W.1.	Museum 5742/3
Goodsell	Goodsell Limited, 40 Gardner Street, Brighton, 1.	Brighton 65752
Grundig	Grundig (G.B.) Limited, Newlands Park, London, S.E.26.	Sydenham 2211
Inadcon	(Rheem Califone), 14b Wedderburn Road, Hampstead, London, N.W.3.	Hampstead 9702
I.T.M.	International Tutor Machines Limited, Ashford Road, Ashford, Middlesex.	Ashford 4461/3
Monitor (E.T.L.)	Scrivener SLT Ltd., 43/45 Queen's Road, Bristol, 8.	Bristol 26426/7
Opelem	Laycock Electronics, Birch House, Chipperfield, Herts.	Kings Langley 2388
Ostle Electronics	Ostle Electronics, The Outgang, Aspatria, Carlisle.	Aspatria 330
Philips	Philips Electrical Limited, Electro-Acoustics Division, Century House, Shaftesbury Avenue, London, W.C.2.	Gerrard 7777
Pye, H. D. T.	Pye H. D. T. Limited, St. Andrews Road, Cambridge.	Cambridge 58985
Rank	Rank Audio-Visual, Woodger Road, Shepherds Bush, London, W.12.	Shepherds Bush 2050
Revox	C. E. Hammond & Co., Ltd., 90 High Street, Eton, Windsor, Berks.	Windsor 62762

Saunders	W. H. Saunders (Electronics) Ltd., Gunnels Wood Road, Stevenage, Herts.	Stevenage 981
Shipton Electronic Tutor	Shipton Automation (Sales) Ltd., Educational Aids Division, Africa House, 64-78 Kingsway, London, W.C.2.	Chancery 1161
Tandberg Electronic Teaching Systems	Elstone Electronics Limited, Edward Street, Templar Street, Leeds, 2.	Leeds 35111
T.R.W.	Electronic Classrooms Limited, 44 Southern Row, Kensington, London, W.10.	Ladbroke 4775
Victoria	Connevans Limited, Westminster Bank Chambers, Bridge Street, Leatherhead, Surrey.	Leatherhead 2671